

Application of UAS in Forest Firefighting for Detecting Ignitions and 3D Fuel Volume Estimation

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Abstract : The article presents results from the AF3 project "Advanced Forest Fire Fighting" focused on Unmanned Aircraft Systems (UAS)-based 3D surveillance and 3D area mapping using high-resolution photogrammetric methods from multispectral imaging, also taking advantage of the 3D scanning techniques from the SCAN4RECO project. We also present a proprietary embedded sensor system used for the detection of fire ignitions in the forest using near-infrared based scanner with weight and form factors allowing it to be easily deployed on standard commercial micro-UAVs, such as DJI Inspire or Mavic. Results from real-life pilot trials in Greece, Spain, and Israel demonstrated added-value in the use of UAS for precise and reliable detection of forest fires, as well as high-resolution 3D aerial modeling for accurate quantification of human resources and equipment required for firefighting.

Keywords : forest wildfires, surveillance, fuel volume estimation, firefighting, ignition detectors, 3D modelling, UAV

Conference Title : ICFFDM 2020 : International Conference on Forest Fire Disaster Management

Conference Location : Rome, Italy

Conference Dates : December 10-11, 2020